

THE REDISCOVERY OF *PAGURUS ACANTHOLEPIS* (STIMPSON)  
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## Abstract

Gunn, S.W. and McLaughlin, P.A., 1988. The rediscovery of *Pagurus acantholepis* (Stimpson) (Decapoda: Anomura: Paguridae). *Memoirs of the Museum of Victoria* 49: 67-71

The discovery of males of *Pagurus acantholepis* (Stimpson) has shown that this species was incorrectly assigned to *Pagurus*. It is redescribed, illustrated and reassigned to *Micropagurus* McLaughlin as herein emended. This species has also been found to be the senior synonym of *Anapagurus australiensis* Henderson. Henderson's male syntype is designated the neotype of *Eupagurus acantholepis* Stimpson.

## Introduction

During surveys of the fauna of coastal waters of Victoria and of Bass Strait, Australia, by members of the Marine Research Group associated with the Museum of Victoria, a few specimens of a hermit crab species apparently referable to *Pagurus acantholepis* (Stimpson) were collected. However, the presence of a sexual tube in the males indicated that these specimens could not be correctly assigned to *Pagurus*. Stimpson's (1858) description of *Eupagurus acantholepis*, published in a preliminary account of the decapod crustaceans collected during the North Pacific Exploring Expedition of 1853-1856, was based on a single female from Port Jackson, New South Wales. The subsequent final report of the Expedition, although prepared by Stimpson before his death in 1872, was not published until 35 years later (cf. M. Rathbun, 1907). The two descriptions of *Pagurus acantholepis* are essentially the same; however, in the latter publication Stimpson (1907) remarked that his species presented some "peculiarities" which might require its removal from *Pagurus* and that knowledge of the male was desirable. The only other published reports of this species are the bibliographic references of Alcock (1905) and Gordan (1956).

The type of *P. acantholepis* was undoubtedly destroyed in the 1871 fire at the Chicago Academy of Sciences where Stimpson's collections were housed (cf. R. Rathbun, 1883). However, there is

sufficient agreement between Stimpson's (1858, 1907) descriptions and the Victorian specimens, particularly in the development of multispinose ocular acicles and prominent interocular lobes ("bifurcated bracteole" of Stimpson) to convince us that they do represent Stimpson's taxon.

Henderson (1888) also described a pagurid species from Port Jackson, which possessed multispinose ocular acicles and a male left sexual tube. An examination of the syntypes of Henderson's *Anapagurus australiensis* has shown that prominent interocular lobes are similarly developed in this taxon and in all other characters it also agrees with the Victorian specimens. Thus we believe that Stimpson's (1858) *Eupagurus acantholepis* is the senior synonym of *Anapagurus australiensis*. In the interest of nomenclatorial stability we herein designate the male syntype of Henderson's *A. australiensis* as the neotype of *E. acantholepis*.

McLaughlin (1986) described a new monotypic Hawaiian genus, *Micropagurus*, that she related to *Anapagurus* and *Spiropagurus* because of the similar development of the male left sexual tube. However, she differentiated *Micropagurus* from the other two genera by the presence of multispinose ocular acicles; a telson lacking a transverse suture but with the terminal margin entire; and the absence of the male right gonopore. In her discussion, McLaughlin noted that both *Anapagurus australiensis* and *A. polynesiensis* Nobili pos-

sessed multispinose ocular acicles and the latter species, at least, lacked the male right gonopore (cf. de Saint Laurent, 1968) thus both might also be referable to *Micropagurus*. Subsequently, Haig and Ball (in press) did assign both species to *Micropagurus*. In her generic diagnosis, McLaughlin (1986) did not mention the presence of interocular lobes; however, she did figure these structures in *M. devaneyi* McLaughlin (fig. 4a).

As previously indicated, the presence of a male sexual tube in Stimpson's (1858) taxon excludes it from *Pagurus*. In all characters, except the absence of the male right gonopore, this Australian species agrees with *Micropagurus*. Although intrageneric and/or intraspecific variation in male gonopore development has not been reported in paguroids, such variation in female gonopores occurs in species of *Paguristes* (cf. Forest, 1954; de Saint Laurent, 1968), *Diogenes* (Tirmizi and Siddiqui, 1982) and *Pagurixus* (de Saint Laurent, 1968; McLaughlin and Haig, 1984). Therefore, in our opinion, the single character, presence or absence of the male right gonopore does not justify the erection of two genera that in all other characters appear identical. It is preferable that *Micropagurus* be emended to include species in which the right gonopore may be developed in the male. As interocular lobes ["écailles" of Bouvier (1896)] have also been reported in *Anapagurus bicorniger* A. Milne Edwards and Bouvier and *Anapagurus petiti* Dechance and Forest (cf. Bouvier, 1940; Dechance and Forest, 1962; Garcia Raso, 1982), the characters most useful for separating species of *Micropagurus* from species of *Anapagurus* are the configuration of the telson and armature of the ocular acicles.

***Micropagurus acantholepis* (Stimpson)**  
comb. nov.

Figure 1

*Eupagurus acantholepis* Stimpson, 1858: 251.—Stimpson, 1907: 229.

*Anapagurus australiensis* Henderson, 1888: 74, pl. 7, fig. 8.

*Pagurus acantholepis*.—Rathbun, 1907: 229 (footnote).

**Type material.** Neotype (herein selected): male syntype of *Anapagurus australiensis*, SL = 1.7 mm, British Museum (Natural History) 1888:33, HMS "Challenger", 3.6-18 metres, Port Jackson, New South Wales, Australia.

Female syntype of *Anapagurus australiensis*, SL = 1.8 mm, BMNH 1888:33, HMS "Challenger", 3.6-18 metres, Port Jackson, New South Wales, Australia.

**Other material.** Victoria. Honeysuckle Point, Western Port (38°26'S, 145°04'E), intertidal rock platform, S.W. Gunn, 26 Nov 1986, NMV J14231 (1 male); 11 Nov 1902,

NMV J14233 (1 male); S.W. Gunn, 17 Feb 1985, NMV J12185 (1 male). Eagles Nest, near Inverloch (38°40'S, 145°41'E), intertidal rock platform, S.W. Gunn, 26 Nov 1985, NMV J14232 (1 male). Port Phillip Bay, no details, NMV J12177 (1 male). Port Phillip Bay, Port Phillip Heads region (38°16'S, 144°41'E to 38°20'S, 144°51'), 8-12.5 m, dredged, Marine Research Group, Mar 1986 to Apr 1987, NMV J14558 (5 females), J14559 (1 male, 1 female), J14560 (6 males, 1 female), US Museum of Natural History 234302 (1 male, 1 female), Allan Hancock Foundation 2778-01 (1 male, 1 female), Australian Museum, Sydney P37799 (1 male, 1 female). Point Lonsdale (38°17'S, 144°37'E), intertidal, Marine Research Group, 12 Mar 1987, NMV J14561 (1 male).

South Australia, Spalding Cove, Port Lincoln, 47 m, 5 Nov 1969, NMV J14566 (1 male).

**Description.** Shield considerably longer than broad; anterior margin between rostrum and lateral projections concave; posterior margin truncate. Rostrum broadly rounded, little if any in advance of lateral projections, unarmed or with tiny spinule laterally. Lateral projections broadly rounded, unarmed. Ocular peduncles two-thirds to three-quarters length of shield, slightly inflated basally and in corneal region, dorsomesial surface with widely spaced tufts of short setae. Ocular acicles with 3-4 (rarely 1) marginal spines; separated by slightly less than basal width of 1 acicle. Interocular lobes prominent, chitinous or weakly calcified, and with few setae. Antennular peduncles reaching bases of corneae or only slightly beyond; ultimate and penultimate segments with few setae; basal segment with unarmed protuberance on dorsolateral distal angle. Antennal peduncles not overreaching ocular peduncles; with supernumerary segmentation; fifth and fourth segments with scattered setae; third segment with spine at ventral margin; second segment with dorsolateral distal angle produced, terminating in strong simple or bifid spine, dorsomesial distal angle with small spine; first segment with small spine on lateral margin and well developed spine on produced ventral margin. Antennal acicle short, slightly arcuate, terminating in small spine; mesial margin with tufts of setae. Antennal flagella short, with 1 or 2 moderately short and occasionally 1 or 2 longer setae every 1 or 2 articles. Third maxilliped with well developed crista dentata provided with 1 accessory tooth; merus and carpus each with prominent dorsodistal spine. Sternite of third maxillipeds unarmed. Sternite of fifth pereopods with 2 asymmetrical, widely separated lobes, each with few terminal setae.

Right cheliped with dactyl approximately two-thirds length of palm; cutting edge with 1 or 2 prominent calcareous teeth proximally, sometimes

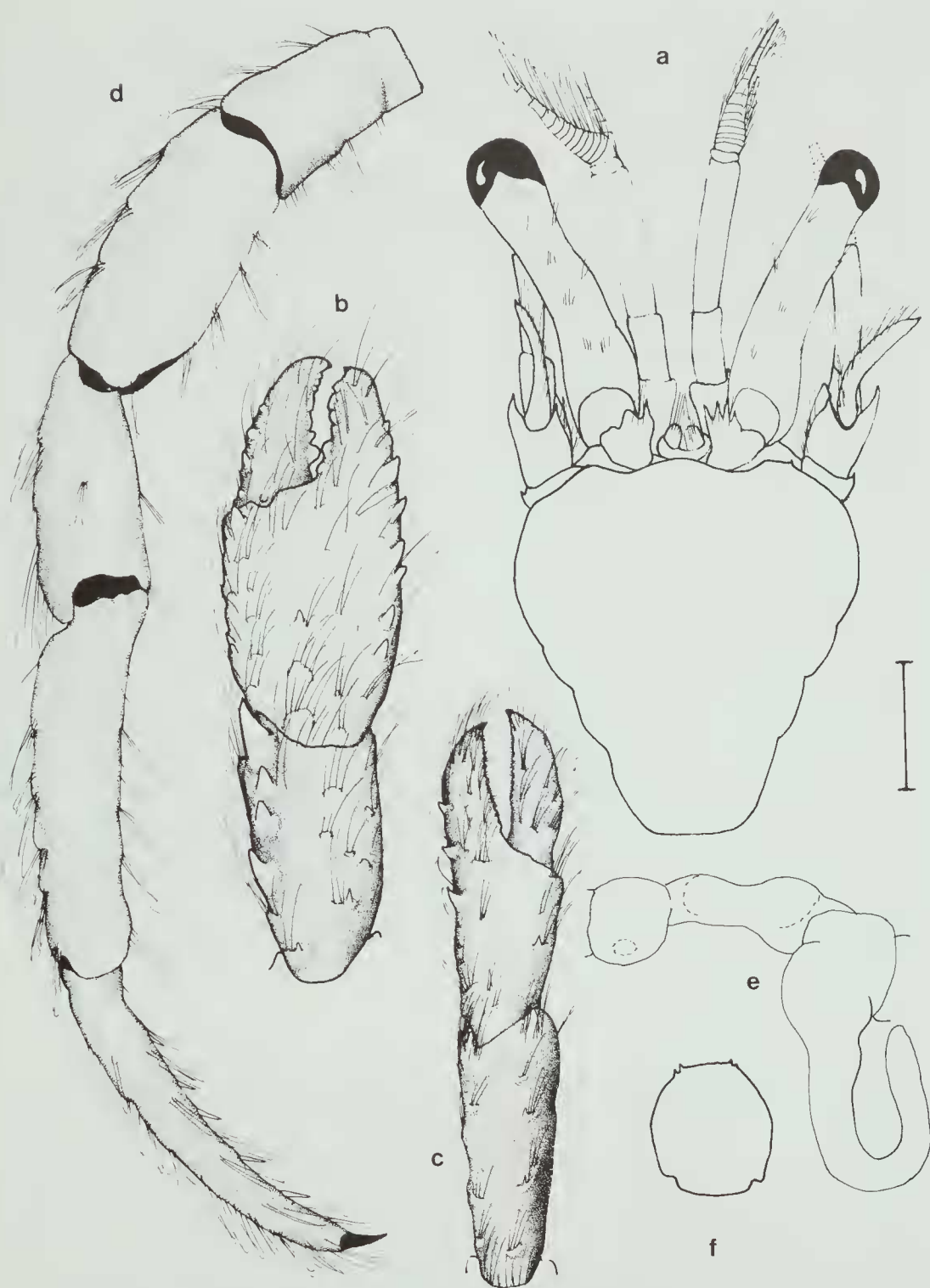


Figure 1. *Micropagurus acantholepis* (Stimpson), male, Port Phillip Bay, Victoria, J12177. a, shield and cephalic appendages; b, right chela and carpus; c, left chela and carpus; d, left third pereopod (lateral view); e, coxae and sternite of fifth pereopods illustrating male left sexual tube; f, telson. Scale = 1 mm.



separated by 1 smaller tooth, few small calcareous teeth distally; slightly overlapped by fixed finger; dorsomesial margin with 2 or 3 spines proximally and occasionally 1 small spinule at proximal angle; few scattered setae on all surfaces. Palm slightly shorter than carpus; dorsomesial margin with 1-4 spines proximally separated from single distal spine by broad space, dorsal surface with 2 spines or tubercles proximally and 1 medially, dorsolateral margin with row of widely spaced spines extending onto proximal half of fixed finger; all surfaces with scattered short to moderately long setae. Carpus approximately equal to length of merus; dorsomesial margin usually with 2 to 4 strong spines distally and smaller spine in proximal half, occasionally only protuberances, dorsal surface with 1 or 2 protuberances or spines distolaterally transverse ridges extending onto lateral face, occasionally with spine on lateral face in proximal half. Surfaces all with scattered setae. Merus with slight protuberance proximally on ventromesial margin and distally on ventrolateral margin; and with scattered setae dorsally and ventrally.

Left cheliped only slightly shorter than right; dactyl as long as or slightly longer than palm, unarmed but with scattered setae on all surfaces. Palm approximately half length of carpus; slightly protuberant in midline proximally and occasionally armed with single spine; dorsomesial margin with 1 or 2 spines proximally and frequently low protuberances distally; dorsolateral margin with few widely-spaced spines sometimes extending onto fixed finger; surfaces with scattered setae. Carpus shorter than merus; dorsolateral margin with row of 3 or 4 spines, dorsomesial margin with low protuberances and/or spines; tufts of setae often arising from low, occasionally spinulose, protuberances on mesial, lateral and ventral surfaces. Merus with low protuberance on ventromesial margin proximally and tufts of setae distally and ventrally.

Ambulatory legs similar in armament and ornamentation. Dactyls as long or slightly longer than propodi, each terminating in moderately strong, corneous claw; dorsal margins and mesial faces each with row(s) of moderately long setae; ventral margins each with row of 5-9 widely spaced corneous spines, sometimes not reaching to base of claw. Propodi approximately twice length of carpi; unarmed but with protuberances from which tufts of setae arise. Carpi slightly shorter than meri; unarmed but with well developed protuberances and tufts of setae, particularly on dorsal margins. Meri unarmed but with dorsal and ventral protuberances

and tufts of setae. Propodal rasp of fourth pereopod with 2 or 3 rows of corneous scales; dactyl with very small terminal claw and apparently no preungual process.

Male with coxa of fifth left pereopod slightly to considerably larger than right, with well developed sexual tube recurved upward to level of coxa of fifth pereopod. Coxa of fifth right pereopod with gonopore on posteroventral surface. Pleopods 3-5 uniramous or occasionally biramous. Female with paired gonopores, 4 unpaired pleopods, pleopods 2-4 unequally biramous, pleopod 5 uniramous. Uropods extremely asymmetrical, with right exopod approximately equal in size to left endopod. Telson without transverse suture; terminal margin entire with 1-3 tiny spinules on each side laterally.

**Colour.** The limited number of specimens so far available indicates a wide range of coloration. A freshly taken specimen reveals a shield and anterior projections flamed and mottled with red and brown, with overall background colour yellowish. The pale ocular peduncles have short, oblique brown markings and the corneae are almost colourless. A very old specimen in alcohol has brown ocular peduncles which have large white circles.

**Distribution.** New South Wales: Port Jackson; Victoria: Port Phillip Bay, Western Port, central coast; South Australia: Port Lincoln.

**Remarks.** The presence of a right male gonopore distinguishes *M. acantholepis* from both *M. devaneyi* and *M. polynesiensis*. In addition, the lack of armature on the dorsal surfaces of the pereopods is a character that can be used to distinguish *M. acantholepis* from *M. devaneyi*.

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# References

- Alcock, A., 1905. Anomura. Fasc. I. Pagurides.—*Catalogue of the Indian decapod Crustacea in the Collections of the Indian Museum* 2: 1-197. Indian Museum: Calcutta.
- Bouvier, E.L., 1896. Les Pagurines des mers d'Europe (Crustacés). Tableaux dichotomiques des genres et des espèces. *Feuilles Jeunes Naturelles* (3)26: 125-128, 149-155.
- Bouvier, E.L., 1940. Décapodes Marcheurs. *Faune de France* 37: 1-404. Paris.
- Dechance, M. and Forest, J., 1962. Aue *Anapagurus bicorniger* A. Milne Edwards et E.L. Bouvier et *A. petiti* sp. nov. (Crustacea Decapoda Paguridae). *Bulletin du Muséum National d'Histoire Naturelle* (2)34: 293-307.
- Forest, J., 1954. Les *Paguristes* des côtes occidentales et méridionales d'Afrique. *Annals of the South African Museum* 41: 159-213.
- Garcia Raso, J.E., 1982. Contribución al estudio de los Paguridos (Crustacea, Decapoda, Anomura) en el litoral submediterráneo español. *Investigaciones Pesquera* 46: 493-508.
- Gordan, J., 1956. A bibliography of pagurid crabs, exclusive of Alcock, 1905. *Bulletin of the American Museum of Natural History* 108: 253-352.
- Haig, J. and Ball, E.E., in press. Hermit crabs from north Australian and eastern Indonesian waters (Crustacea Decapoda: Anomura: Paguroidea) collected during the 1975 "Alpha Helix" Expedition. *Records of the Australian Museum*.
- Henderson, J.R. 1888. Report on the Anomura collected by H.M.S. "Challenger" during the years 1873-76. *Report of the Scientific Results of the Exploring Voyage of H.M.S. "Challenger" 1873-76, Zoology* 69: 1-102.
- McLaughlin, P.A., 1986. Three new genera and species of hermit crabs (Crustacea: Anomura: Paguridae) from Hawaii. *Journal of Crustacean Biology* 6: 789-803.
- McLaughlin, P.A. and Haig, J., 1984. A review of *Pagurixius* (Decapoda, Anomura, Paguridae) and a description of new species. *Crustaceana* 47: 121-148.
- Rathbun, M.J., 1907. Introductory note. In: Stimpson, W., Report on the Crustacea (Brachyura and Anomura) collected by the North Pacific Exploring Expedition, 1853-1856. *Smithsonian Miscellaneous Collections* 49: 3-4.
- Rathbun, R., 1883. Descriptive catalogue of the collections sent from the United States to the International Fisheries Exhibition, London, 1883, constituting a report upon the American section. Prepared under the direction of G. Brown Goude. Part G. Descriptive catalogue of the collections illustrating the scientific investigation of the sea and fresh waters. *United States National Museum Bulletin* 27: 511-621.
- Saint Laurent, M. de, 1968. Revision des genres *Catapaguroides* et *Cestopagurus* Bouvier (Crustacés Décapodes Paguridae). *Bulletin du Muséum National d'Histoire Naturelle* (2)40: 539-552.
- Stimpson, W., 1858. Prodomus descriptionis animalium everttebratorum, quae in Expeditione ad Oceanum Pacificum Septentrionalem, a Republica Fedcrata missa, Cadwaladaro Ringgold et Johanne Rodgers Ducibus, observavit et descripsit. Pars 7. Crustacea Anomura. *Proceedings of Natural Sciences of Philadelphia* 10: 225-252.
- Stimpson W., 1907. Report on the Crustacea (Brachyura and Anomura) collected by the North Pacific Exploring Expedition, 1853-1856. *Smithsonian Miscellaneous Collections* 49: 5-240.
- Tirmizi, N.M. and Siddiqui, F.A., 1982. *The marine fauna of Pakistan: 1 Hermit crabs (Crustacea, Anomura)*. University Grants Commission. Saad Publications: Karachi. 103 pp.